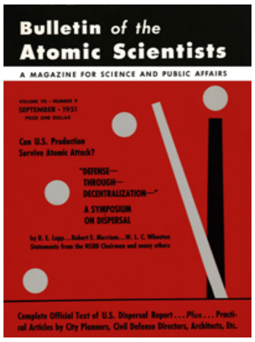

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Can U.S. Production Survive Atomic Attack?

"DEFENSE—THROUGH—DECENTRALIZATION—"

A SYMPOSIUM ON DISPERSAL

by R. E. Lapp...Robert E. Merriam...W. L. C. Wheaton
Statements from the NSRB Chairman and many others

Complete Official Text of U.S. Dispersal Report . . . *Plus* . . . Practical Articles by City Planners, Civil Defense Directors, Architects, Etc.

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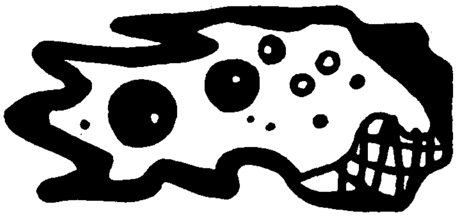
INDUSTRIAL DISPERSION IN THE UNITED STATES



RALPH E. LAPP

Ralph E. Lapp will need no introduction to regular readers of the Bulletin. Author of the best seller, 'Must We Hide?", which was in part an answer to David Bradley's earlier book, Dr. Lapp has written frequent controversial articles for the general magazines—so many that it is sometimes overlooked that he has also been a leader in civil defense planning, as well as an advisor to several government agencies, such as the Office of Civil Defense, the U.S. Navy, the NSRB, etc.

WHEN this nation was faced with the task of mobilizing its industrial resources for World War II it undertook a vast construction program which ultimately increased the manufacturing capacity by 50 per cent and earned for the United States the title "the arsenal of democracy." Even in the 1940's when there were no atomic bombs to worry about the Office of Production Management established a Plant Site Board and to use the language of its summary report: "So far as possible an attempt was made to locate plants away from highly industrialized areas."

Many of the war plants built during the period 1940–1945 were located in sites, which were judged safe so far as attack with high explosive bombs was concerned, and a few were built well beyond the city limits. However, the danger from enemy attack was not critical and the Plant Site Board did not force its hand in dispersing U.S. industry to any considerable extent. The type of pattern for plant location may be called peripheral dispersion in as much as the establishments ringed the city.

Today the United States is well advanced in its industrial mobilization for what may well be World War III. American industry, although fortified by $106 billions of business expenditures for new plant and equipment since the war, has launched into a new program of industrial construction to fulfil the requirements of global warfare. A logical person might assume that the federal government would reconstitute a Plant Site Board within the Office of Defense Mobilization with the specific directive that it insure industrial invulnerability by locating new plants in non-target areas, or at least in sites well out of bomb range. The mechanism already exists for such site selection and, indeed, the basic policy has been advocated by the National Security Resources Board. However, in the first year of the present defense effort the policy of industrial dispersion has been only talked about and not put into effect.

INDUSTRIAL DISPERSION

Two Congressional committees have stressed the need for implementing a policy of industrial dispersion. Senator Joseph C. O'Mahoney's Joint Committee on the Economic Report has issued a careful study of the over-all problem and the Senator, himself, has sponsored an amendment to the Defense Production Act "to discourage the continued geographic concentration of industry." Another committee, headed up by Porter Hardy, Jr., has investigated the awarding of accelerated tax amortization through the instrumentality of certificates of necessity for new plant construction and it has sharply criticized both the National Security Resources Board and Mr. Charles E. Wilson's Office of Defense Mobilization for their failure to encourage industrial dispersion. A committee report states: "Under the present policy no effort is made by the government to control the location of new facilities through certificates; the selection of the site is left entirely to the applicant. Quite naturally, this policy results in further concentration of industry in areas favored by economic factors wholly without regard to the consideration of military security or the avoidance of knock-out blows in the event of a sudden enemy attack."

Not only has U.S. industry shown itself to be unmindful of the hazard of atomic attack in five post-Hiroshima years but even in the sixth year—the period of intensive mobilization for defense—industry has proceeded to build its factories, offices, and facilities as though the United States were somehow magically immune to atomic bombs. New plants have been erected within the congested areas of cities which any high school boy knows are prime targets for attack. Many other plants have been placed close to the city limits offering a token type of dispersion only to be invalidated within a few years by the continuous outgrowth of residential and industrial construction. Thus the marginal value of locating plants outside the built-up area of the city was soon lost as the city pushed outward in its rapid postwar growth, filling up the all important open spaces between city and plant.

Atomic scientists may justifiably wonder if government officials and industrialists have understood their preachments about the sound value of dispersion as a defensive measure against atomic attack. Certainly, the record would indicate that the scientists' words have not been heard, or, if heard, they have been reflected into outer space. A high order of insanity must invest a society that assiduously builds bigger bombs and blithely goes about making the best targets for such weapons.

Why has the government, or industry, persisted in its semi-suicidal pattern of pre-atomic industrial development? Answers to this question will be found entangled in economic, political, and psychological factors. Three contributing causes can be described.

First, industrialists, finding they ran into no official rebuke, kept on grinding along in their time-honored rut of industrial location, picking sites on the basis of availability of labor, transportation, housing, power, raw materials, and on the basis of proximity to good supply and distribution centers. These are the usual factors considered in site selection. If any businessmen proposed voluntary dispersion they were frowned upon by those who argued that this would involve greater costs and would result in a lower margin of profit. Since the profit motive is the keystone of American business, industrial dispersion received an undeserved black name. This was more unfortunate, for it resulted from an adolescent concept of what is meant by dispersion. Many thought of dispersion in terms of locating plants in the badlands of the Dakotas or on the plains of Kansas. A high degree of effective dispersion can be achieved within the same state, often within the same county.

Second, the concept of bigger atomic bombs actually jeopardized dispersion rather than insuring it. Industry's planners were confronted with the problem of how large the plant to city limit distance, i.e., the dispersal distance, should be. This problem might have been uniquely solved had it not been for the premature birth of the H-bomb. Public acceptance of a thousand-fold more powerful bomb convinced many that "no place was safe" and you might just as well build your next plant inside a city. Every weapon, however, knows the limitation of space, and it is perfectly possible to plan safe industrial location even against the yet-to-be-born hydrogen bomb. No unque dispersal distance can be fixed upon for it depends upon terrain, upon the nature of the target, and upon the criticality of the proposed plant. In hilly country the distance will be much smaller than for a flat plain. As a general rule, government experts in consultation with the Department of Defense and the Atomic Energy Commission have agreed that a dispersal distance of ten to twenty miles is adequate.

Finally, a rather bizarre type of reasoning has grown up in this country. It is the assertion that our air force can obliterate Soviet industry and military strength so that the United States is secure from attack. When one pursues this argument and points out that "What is sauce for the goose is sauce for the gander," and therefore U.S. industry is almost certainly doomed to the same fate as that of the Soviets, the more so because our strategic effort is likely to be retaliatory in nature, one often finds a paradox. Supposedly intelligent men will argue that our air force can accomplish a lethal strategic strike at Russia and at the same time prevent the Soviets from dropping A-bombs on our concentrations of industry. Even General Vandenberg, Chief of Staff of our Air Force, testifying in the MacArthur hearings, has stated: "If the Russian air force has the atomic bombs and the ability to deliver them, we have an air force that can take the attrition that would be necessary to destroy that air force, and destroy it promptly; and after that, have a sufficient air force left to destroy the manufacturing potential of Russia. . . ." This statement contrasts violently with General Vandenberg's signed article (Feb. 19, 1951, *Saturday Evening Post*) wherein it is stated: "Should war come, we can be expected to destroy no more than 30 per cent of the planes making an attack in strength on the United States before their bombing missions are completed." Despite the contradiction, it would seem that this is another "goose-gander" problem; if we penetrate Soviet defenses, it must be assumed that the Soviets have the ability to strike at our homeland.

CONCENTRATION OF INDUSTRIAL FACILITIES

Looking closely at our industrial strength, as though through Soviet eyes, it is easy to diagnose our atomic ills: our industrial facilities are too strongly concentrated within about fifty prime target areas. The prescription for this dangerous ailment can be given in one word—"disperse." Putting such a policy into effect will be extremely difficult, for America is already far advanced in its Industrial Age, and the geographical pattern of its production facilities is fairly well established. Any sane program of dispersion must begin with this status quo of industry—take into account the enormous fixed investment of industry in its plant and equipment. It must also recognize that in effecting dispersion, the backbone of our production capacity must not be dislocated, so that the flow of defense goods to the armed forces is reduced. Furthermore, the spirit of competitive enterprise in business must be maintained.

At first, it might seem that any conceivably effective program of dispersion would be impossible of realization. However, there are important factors which make the goal not too distant nor too impossible of attainment.

NOT ALL INDUSTRY VULNERABLE TO ATTACK

Not all industry is essential to defense. The War Production Board is authority for the statement that ". . . great as our war effort was, at no time during the struggle did it absorb more than two-fifths of our total national output." *Nor is all defense industry vulnerable to attack.* No one has yet published an estimate of how much of our industry is both critical to defense and vulnerable to attack, but the fraction is probably less than one-third of the total industry. (Both the Facilities Protection Board of the National Security Council and the Industrial Evaluation Board of the Department of Commerce are known to be assessing the criticality and vulnerability of U.S. industry, but the studies have just begun and no results will be available for some time.)

Even one-third of American industry is a staggering complex of plants and facilities to consider for dispersion, but we do not propose to uproot these installations and replant them in safe locations. This would not only disrupt our present defense effort but it would disjoint our entire national economy as well. The dollar cost for such an operation would probably run to about $90 billions.[1] Since we are spending $23.9 billions for new plants and equipment in 1951, it would seem at first that replacement of critically important, vulnerable industry, would be possible in several years. However, the dollar costs are only part of the picture; one must also consider the supply of building materials, labor, housing, and all the other factors which back up the production line. Nonetheless, a very considerable fraction of U.S. industry could be replaced within a decade; but no such program is in operation.

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[1] Figures are taken from an article "Industry Forgets the A-Bomb," published in the August 7, 1951 issue of *The Reporter*. The author wishes to thank *The Reporter* for permission to use these and other data from the article.

Perhaps it is well to ask bluntly: "What does the government propose to do about dispersion? Does it have a planned program?"

No official statement of policy has been announced by the federal government but it is understood that one is expected from the White House momentarily and in fact may have been issued by the time this appears in print.[2] In 1948, the National Security Resources Board published a brochure *National Security Factors in Industrial Location*[3] in which dispersion was advocated. However, the NSRB publication was an expression of attitude rather than a pronouncement of policy. With the issuance of the brochure, planning for industrial dispersion was continued by NSRB but was laid aside, both by that agency and by the newly created Office of Defense Mobilization, when the Korean War broke out.

REVITALIZATION OF GOVERNMENT DISPERSION PROGRAM

Now that the government has approved some seven billion dollars of tax certificates and industry is well on its way to erecting the facilities to turn out defense goods for the rearmament drive, NSRB has revitalized its dormant dispersion program. Both the Department of Defense and the Office of Defense Mobilization have belatedly agreed that new plants should be located so as to improve the nation's security. Other government agencies have also promised to apply pressure to industry so that further concentration of production facilities in target areas will be averted. However, this harmony of view could only become effective if solidified by an Executive Order from the White House.

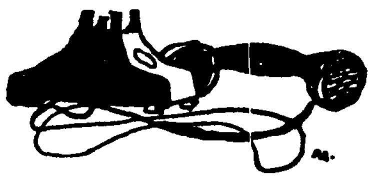
Before the President signs a policy statement committing the various government agencies to a firm program of industrial dispersion, he must grapple with the political implications of the move. The Congress has already shown in several stormy sessions that it considers industrial dispersion to be political dynamite. Many Congressmen, especially those from the New England states, have jumped to the conclusion that the Administration proposes to rip plants out of the Northeast, and spread them throughout the prairie states. They are haunted by the precedent of the Chance Vought Company, abruptly relocated from Connecticut to Texas, and have visions of a multiplicity of such moves.

While it has not yet been formally announced, it is certain that the government's policy of dispersion will be to recommend the location of new plants within the market area of a city, but far enough from the centers of concentrated population and existing industry, so that the new facilities will be out of the range of bombs dropped on these centers.

Industrialists are thus still left with great latitude in site selection, for the government does not propose to direct plant location but rather to reject site choices if they prove inimical to national security. One can find little wrong with this solution which recognizes the importance of economic factors and seeks to reconcile them with the national security.

THE SEATTLE PLAN

A plan of this type has been put into operation in Seattle, Washington, as a kind of pilot plant study for the whole nation. NSRB experts have evolved this plan in cooperation with the Seattle Chamber of Commerce. New industrial sites, five, ten, and fifteen miles from downtown Seattle, have been selected for development. The government hopes that the Seattle Plan will be adopted by other cities and that a sound policy of industrial dispersion may result from this experiment.



The Seattle Plan is basically sound and its success in the Seattle area seems probable for three reasons. First, Seattle businessmen were taught a severe lesson when Secretary of the Air Force, W. Stuart Symington, directed that the production of B-47 Boeing jet bombers be transferred from Seattle to Wichita, Kansas. The Seattle Chamber of Commerce saw the handwriting on the wall and when approached by NSRB with a workable plan of dispersion for industrial security, it quickly accepted the idea. Second, the City of Seattle has a metropolitan area population which ranks twentieth in the nation; thus it is still a fairly modest metropolis, without many of the industrial headaches of Detroit, Chicago, or Philadelphia. A plan which is excellent for Seattle, may be not too satisfactory for Detroit. Third, the country surrounding Seattle is such that good industrial sites are partitioned off by hilly terrain and large lakes. The Seattle type of dispersion can only be effective if open space is permanently maintained between industrial sites; this is insured by the local terrain, but such would not be the case for Chicago or a score of other cities.

In adapting the Seattle Plan to other municipalities, the government must, of course, specify modifications, but will retain the same principle of establishing new industrial sites ten to twenty miles from the densely populated and highly industrialized centers. The exact distance will have to be worked out for each target area. Some restrictions, equivalent to zoning laws, will have to be put into effect to prevent the intervening open spaces from being filled with new industrial or residential construction, for unless permanent open space can be maintained, the Seattle Plan will not achieve maximum effectiveness.

EFFECTIVE DISPERSION MUST PROTECT BOTH PLANTS AND LABOR FORCE

Spreading out factories into a less vulnerable pattern will be only a partial protection for industry, if the worker force needed to run the plants remains condensed in the metropolitan area. If, however, the dispersal distance is great enough, masses of labor will gravitate to the sources of their income, so that a sound policy of dispersion can accomplish the protection of both the plants and the labor force. Workers in critical industries must be encouraged to take up residence outside the cores of metropolitan areas. Unless the critical labor force is so dispersed, an enemy may elect to stop the wheels of American industry by carrying out saturation raids on the metropolitan centers, on the theory that it is easier to hit at the man behind the lathe than at the lathe itself.

Statistics on the population of our metropolitan areas are most alarming. For example, our twelve largest metropolitan cities contain a total of twenty-three million people. Some consolation may be found in the fact that an additional twenty million live in the

[2] See page 264 of this issue.

[3] *Bulletin*, October, 1948, p. 316.

same metropolitan areas outside the city limits. Many metropolitan suburbs may be considered relatively dispersed but, in most of them, the principle of sound dispersion has been doubly violated. First, the distance from metropolitan to suburban center is too small; in fact, the two often adjoin each other. Second, such open space between the city and the suburb as existed initially, has long since been filled with dwellings, so that the metropolitan area has become one huge target rather than a cluster of individual targets.

Just as U.S. industry, concentrated in a relatively small number of centers, seems too colossal an aggregate to be attacked with the instrument of dispersion, so, too, does the conglomeration of people in even fewer centers seem to be irreversible. While these centers are extremely vulnerable to atomic attack, almost impregnable political armor protects them against any attack by dispersal forces. This is one of the reasons why the government will strongly favor a type of dispersion which retains the plant within the market area of the city to which it now belongs. Civic officials will not raise serious objection to the location of *plants* ten or even twenty miles from the city, since this is well within the city's market area, and the city will still benefit from their presence. If, however, the city itself is to lose many residents, civic objections will be very strenuous.

The same philosophy adopted toward plant dispersion must be used in the case of the worker's residence. New residential construction should be encouraged in non-target areas. As old dwellings obsolesce in the centers of target areas, they should be torn down and not replaced. The Federal Housing Administration should refuse to grant aid to those seeking to cram more buildings within the heart of a metropolitan area. Such measures will result in gradual depopulation of the target centers and a build-up in the outlying regions.

Those who are opposed to dispersion as well as those who are lukewarm about it, seize upon the word "gradual" and immediately point out that nothing of significance can be accomplished before we have a showdown in Europe. The date for the latter is often mentioned as "about 1953." How does one meet the argument that dispersion can hardly get started within two years? One way is to point out that there is nothing sacred about the 1953 deadline and that we may well be subjected to the stress for a decade or longer before it is decided whether the East and West take to the battlefield. But there is a much more sound approach—that is to simply acknowledge that an across-the-board type of dispersion cannot make more than a dent in our industrial-population complex within two years. If we are to achieve any significant degree of dispersion in this time period, the approach must be highly selective. The concept of *selective* dispersion is new and requires a cold-blooded analysis of what is critical to our national defense.

SELECTIVE DISPERSION NEEDED—EVEN BEFORE AN ATTACK

One way to illustrate how the analysis might be applied to a single city is to imagine that an atomic attack has just occurred on a major industrial center. Assume that a survey party, consisting of General Bradley, Mr. Charles E. Wilson, and local civic leaders, tours the stricken area to assess the damage and to estimate what productive facilities must be restored. Remember that now war has broken out and the nation is fighting for its very life; political factors are out the window and sheer survival is the problem. On this basis, the survey party selects only those plants which are absolutely essential to the existing military needs. Department stores, laundries, restaurants, and scores of purely civilian or home consumer facilities are written off as non-essential. So, too, are industrial facilities which cannot be quickly converted to war production. Top priority goes to those defense plants which can produce the war goods most urgently needed by the armed forces. Defense plants which have been destroyed will not be considered for relocation but much of the intact equipment may be transferred to an outlying factory which survived the disaster.

A critical survey of this type should be conducted now and those installations selected as most critical to the national defense should be given top priority in relocation. Such a selective program of dispersion involves the potential sore spots or bottlenecks of industry and while percentagewise only a small part of defense industry may thus be made invulnerable through relocation, what is thus dispersed will be of crucial importance once an attack takes place. It would be folly to extirpate these supercritical plants without making provision for the protection of the worker force. The relocated plants can be assured in the initial period of at least partial safety of its working force by instituting multiple shifts, so that, as a minimum, one shift will be in the factory whenever the attack may come. Longer term planning will have to provide for rehousing of labor in non-target areas.

The record of production experience in Germany during the last war bears out the wisdom of selective dispersion. Special industries, such as the ball bearing plants, those making aircraft components and others, were given high priority protection. When the bearings industry, concentrated heavily at Schweinfurt, was seriously disrupted by a determined Allied bombing raid, the manufacture of bearings was parceled out to more than a dozen dispersed locations, some of which achieved additional protection through underground construction. Except for the shortages caused by direct bomb damage and momentary loss of production during relocation, the antifriction industry continued to supply the Wehrmacht with all the bearings which were required.

Germany was subjected to a merciless bombardment of high explosives and incendiaries for many months. Bomb damage was scattered, piecemeal, and, only in a few cases, so concentrated that it approached the saturation nature of atomic attack. Hitler had time to disperse and otherwise protect his besieged war plants, and the German record of wartime production is a remarkable one. Had the bomb damage inflicted on Germany been compressed into the span of a few nights rather than years, it is certain that its industry would never have survived. There would have been no time to disperse. This is the very important lesson which must be learned from the German example. If our industry is to be protected, the steps must be taken in advance of the attack, not after the atomic blitz has occurred.

By implementing a planned program of dispersion this nation can erect a system of permanent defenses against the atomic bomb and its big brother—the H-bomb. These defenses will be truly permanent and will be of lasting value in war or peace, quite in contrast to the military defenses which have a very short half-life of effectiveness. Not only are the active military defenses measured in terms of a few years for effectiveness, but within this period they are not guaranteed to be of high reliability. Not even the most sublime optimist, aware of the technological advances in modern weapons systems, believes that America can be transformed into an impregnable fortress, invulnerable to the enemy's A-bombs.

Six years have passed since Hiroshima. Each succeeding year has seen the world brought ever closer to the brink of an atomic war. An all-out atomic armament race has ensued. During these years the Kremlin has directed a widespread dispersion of its industrial facilities. Yet in spite of this example and the self-evident danger of a devastating attack upon our concentrated industry, our government has been too timid to even demur when more and more factories were crammed into prime target areas. If one were of Senator McCarthy's mental inclination, one would suspect that the Kremlin masterminded our postwar industrial expansion, for it is all that Soviet target analysts could hope for.

At this late date it might seem improvident to press for the dispersion of our industry. The hour is admittedly late but the past six years have failed to uncover any suitable substitute for dispersion so it must be adopted now in the hope that a selective program of dispersion, complemented by a broader program, will at least partially secure our industrial ramparts. Failure to undertake these security measures now may be equivalent to writing a death certificate for our industry in the event that our homeland is attacked. Future historians looking back on the early phases of the Atomic Age may well record that America's downfall had its origins in a short sighted policy of industrial production which neglected its obvious vulnerability to atomic attack.

THE BLIGHT OF OUR CITIES

GOODHUE LIVINGSTON, JR.

Mr. Livingston for years has been interested as a citizen, and through his work as Commissioner of the Department of City Planning of the City of New York, in the traffic and housing problems of that metropolis. Now he asks "Why is it that the Mayor of the largest city in the world states publicly that his citizens have no intention of changing their mode of living or their business habits, come what may?" He argues that present technology, even without the bomb, makes it "irrational to keep building up congestion, with all its horrors and dangers."

CIVIL defense is as important toward waging modern war as military defense. What is done or not done to strengthen it in all its phases may spell victory or defeat. Prophecy as to if or when it will be needed is hazardous, as anything can happen. It is safe to say, however, that under present world conditions we are not complete masters of our fate, and it is therefore only prudent to undertake immediately every precautionary step within our power. In fact, to do otherwise would be criminal negligence.

To date no action has been taken on the sole measure which appears to be the only real insurance against untold losses, if not complete destruction. Dispersion of industrial plants and their workers is vital to the country's safety in atomic war. It would also prove a permanent blessing in a peaceful world.

If war does come, many American cities will be partially or completely destroyed, along with a high percentage of their population. Our military leaders have stated that there is no tactical defense against atomic weapons. They have estimated that 60 per cent of enemy bombers can be expected to break through and reach their targets. It should also be remembered that there are other means of delivering atomic bombs than through the air. Today 52 per cent of American industry is concentrated in thirty-five heavily congested areas. Over 50 per cent of our population live in cities of over 100,000. Sixty per cent of our population lives in urban communities which occupy less than 3 per cent of our total land area. It is reported that our strategic air force is pin-pricking enemy production targets on maps. It must be taken for granted that our foes are doing likewise. Our industrial potential is the margin between victory or defeat. The enemy knows that only too well. It has been clearly demonstrated in both World Wars.

Up to now the efforts of the civil defense authorities have been directed solely along remedial lines. Decentralization as the only means of lessening the deadlines of an atomic raid has not been given serious consideration. Dispersion has proved its value on more than one occasion in the past. It was employed successfully against the high explosive bombing in World War II.

CONCENTRATION OF INDUSTRY IN GERMANY

One notable example which stands out and is worth mentioning was the concentration of German ball-bearing production in Schweinfurt. Anti-friction bearings are especially critical in aircraft production, as well as for power plants and military instruments of many kinds. In August 1943, bomber raids were started for the purpose of destroying this vital enemy production. Even though these raids were extremely costly to Allied bombers—due to the depth of penetration they could not be escorted by fighters—the air command continued them through December 1944. The German high command, who at first believed Schweinfurt was safe from our bombers because of the distance and flak-fighter protection, was soon jolted out of such preconceived ideas. They directed that the ball-bearing industry